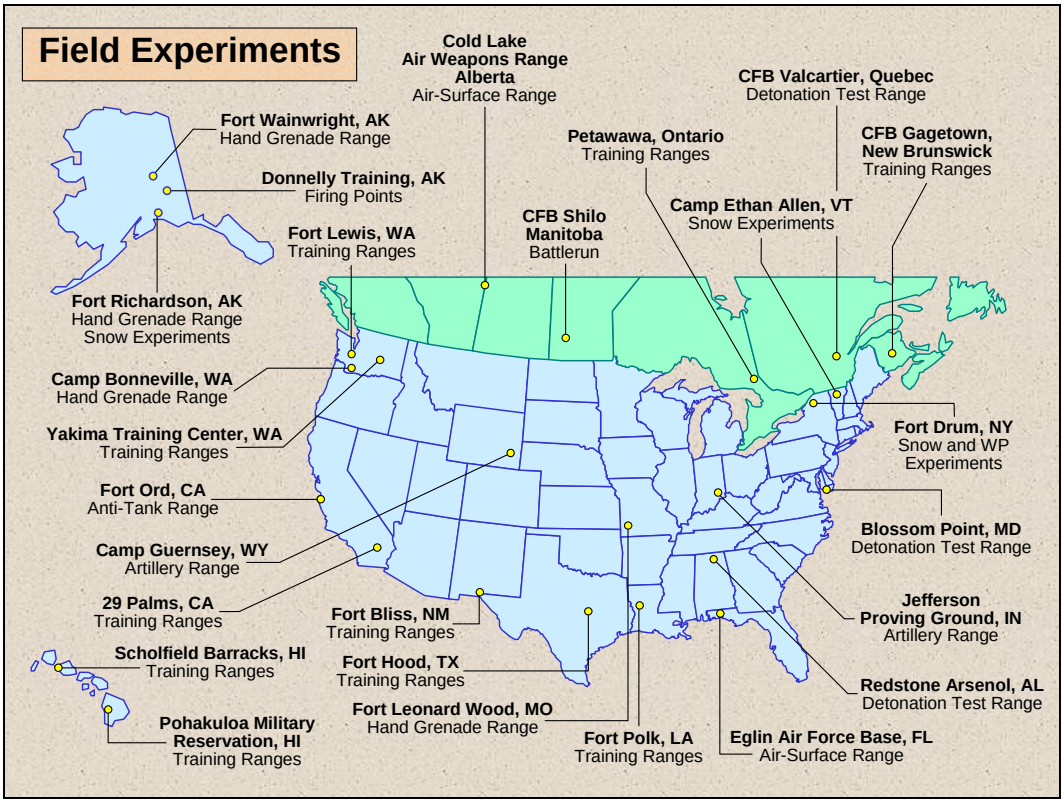
US Army Corps of Engineers®
Engineer Research and Development Center

Energetic Materials Residues on Live-Fire Training Ranges

Problem

Live-fire training is a necessary component of readiness for this country's military forces. Some of these training activities deposit particulate residues of energetic materials on training ranges, and these residues can present a potential for off-site migration. Until recently, the specific types of residues and their distribution on various types of training ranges were largely unknown.



Experiment sites.

Description

Over the past four years, ERDC researchers have determined the concentrations and distributions of residues for a number of ranges in the United States and Canada (see figure, above). Energetic materials can be subdivided into propellants, explosives, and pyrotechnics. Of these, explosives have been studied to the greatest extent. Of the chemicals used in explosives formulations, research has centered on TNT, RDX, HMX, and the manufacturing impurities and environmental transformation products of these compounds. The types of chemical residues deposited and their distribution vary significantly for different types of ranges.

To date, most of the studies that have been conducted have taken place at ranges used by the U.S. Army and the Canadian Army. Army ranges include artillery and mortar ranges, antitank rocket ranges, multipurpose range complexes used for tank firing, hand grenade ranges, rifle grenade ranges, demolition ranges of various types, and portions of Army ranges that have been used by the Air Force or Navy for bombing practice.

Expected Products

The knowledge gained from these studies will be used to guide future characterization activities, making them efficient and cost-effective, and will assist in determining when remediation may be necessary to sustain training.

Potential Users

Target users for this research are Department of Defense (DoD) training range managers tasked with assessing the environmental impacts of training exercises.

Projected Benefits

This project has identified activities at military test and training ranges that have the potential to contribute energetic residues to the environment. As a consequence, remediation technologies are currently under development.

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